

Case 2857

***Scelidosaurus harrisonii* Owen, 1861 (Reptilia, Ornithischia): proposed replacement of inappropriate lectotype**

Alan J. Charig

Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.

Bernard H. Newman

47 Hoop Street, Pearston 5680, Eastern Cape Province, South Africa

Abstract. The purpose of this application is to conserve the use of the name *Scelidosaurus harrisonii* Owen, 1861 for the ornithischian dinosaur to which it is invariably applied. The existing lectotype, misguidedly designated by Lydekker (1888), is a mere fragment now known to represent a bipedal theropod dinosaur phylogenetically remote from *Scelidosaurus* Owen, 1859 (type species *S. harrisonii*) as generally envisaged. A new lectotype is proposed, a nearly complete skeleton (presently a paralectotype) in the Natural History Museum, London, on which the concept of *Scelidosaurus* has always been based.

1. Owen (1859), in an article on 'Palaeontology' in the *Encyclopaedia Britannica*, introduced (p. 150) the generic name *Scelidosaurus* in the following terms: 'Genus SCELIDOSAURUS, OW. — By this name is indicated a Saurian with large and hollow limb-bones, with a femur having the third inner trochanter, and with metacarpal and phalangeal [sic] bones, adapted for movement on land. The fossils occur in the lias at Charmouth, Dorsetshire'. No specific name was mentioned. This description, which was repeated in 1860 (p. 258), applies also to other dinosaur genera known at that time and in consequence does not differentiate *Scelidosaurus* from those genera; nevertheless, it satisfies the criteria of availability, and *Scelidosaurus* Owen, 1859 should be cited with that date of publication. This contrasts with the views of authors such as Newman (1968, p. 40), who, acting on the incorrect advice of Charig, gave 1861 (see para. 2 below) as the date of first valid publication of the name *Scelidosaurus* and listed *Scelidosaurus* Owen, 1859 as a nomen nudum.

2. In 1861 Owen (p. 1) established the new species *Scelidosaurus harrisonii* on the incomplete remains of five fossil reptiles, all stated to have come from the upper part of the Lower Lias in the vicinity of Charmouth; the material was described as fully as its only partly developed state would permit and it was well illustrated. Owen did not designate a holotype, and the type series therefore consisted of five syntypes. *S. harrisonii* is the type species of the genus by subsequent monotypy.

3. The most informative syntype in the series was a nearly complete skull and lower jaw (pp. 7–14), lacking only the tip of the snout, and crudely developed to some degree

with hammer and chisel. The other syntypes were a femur (pp. 2–3); a knee-joint (pp. 3–4); an ungual phalanx (p. 5); and (pp. 5–7) remains which, according to Owen, ‘most probably formed part of a very young or foetal *Scelidosaurus*’.

4. A postcranial skeleton belonging to the same individual as the skull was recovered shortly afterwards; this, like the skull itself, was prepared according to the techniques then in use and was described as fully as possible by Owen (1863). At that time the skull and skeleton (presently no. R.1111 in the Palaeontology Department of the Natural History Museum, London) together represented the most complete individual dinosaur ever found in Britain; that may still be true today, 129 years later. It is upon this unique individual and this alone that our present concept of *Scelidosaurus* rests. We propose the designation of this specimen as the replacement lectotype of *Scelidosaurus harrisonii*.

5. Another specimen (BM(NH) Pal. Dept. no. 39496) in Owen’s 1861 material was the isolated knee-joint (i.e. the distal end of the femur in articulation with the proximal ends of the tibia and fibula), as mentioned in para. 3. Lydekker (1888, p. 182) described it thus: ‘The adjacent extremities of the right femur, tibia and fibula, cemented together by matrix, of a large individual; from Charmouth. The type; figured by Owen, op. cit. pt. i, pl. ii, figs. 1–3’. The surprising fact that Lydekker really did consider this specimen to be the type is made clear by his Catalogue entry (p. 181) for R.1111, which states: ‘This specimen indicates an individual much smaller than the type [39496], its total length being about 11 feet 3 inches’. Lydekker’s reasons for choosing the knee-joint as ‘the type’ are unknown (as noted above, it was far from being the best of Owen’s syntypic series, nor was it the first specimen mentioned in his published description); it may have been because of the larger size of the original animal, or he may simply have made a mistake. Intentional or not, his action constitutes designation of a lectotype under Article 74a of the Code; the knee-joint is thus the lectotype of *S. harrisonii*, and Owen’s four other syntypes (including R.1111) are paralectotypes.

6. Woodward & Sherborn (1890) followed Lydekker in his mistaken belief (or unexplained action); their stated practice (p. xxii) was to indicate ‘the type specimen of each accepted species... in square brackets after the record of the locality’, which in this case they gave (p. 283) as ‘[Right femur, tibia, and fibula; Brit. Mus.]’.

7. Eighty years after Lydekker’s designation of the knee-joint as the lectotype it was discovered by Newman (1968) that this specimen, developed out of the rock by acetic acid (pl. 7, fig. 2), was derived from an entirely different type of animal — a bipedal theropod dinosaur rather than an ornithischian. The consequences of this revised identification are as follows: (a) *Scelidosaurus* Owen, 1859 is a junior subjective synonym of *Megalosaurus* Buckland, 1824; (b) *S. harrisonii* may be a synonym of *M. bucklandi* von Meyer, 1832, the type species of *Megalosaurus*; and (c) the ornithischian dinosaur always known as *S. harrisonii* has no available name.

8. Much of the anatomy of specimen R.1111 remains undescribed, for it was still encased in hard limestone in Owen’s time; indeed, some elements (such as the pubis and ischium) were completely hidden and their presence could only be surmised. During the nineteen-sixties, however, the senior author (A.J.C.) instigated the complete chemical development and redescription of the specimen, and most of the missing elements were subsequently revealed in a generally excellent state of preservation; the development is now almost finished, with only one block still requiring treatment. When the osteology of *Scelidosaurus* is eventually published it will be better known than that of almost any

other dinosaur, and considerably better than that of many extant reptiles. It was upon fossil vertebrates from the Lower Lias of Lyme Regis and Charmouth that the techniques of acid preparation were first worked out (Toombs, 1948; Rixon, 1949; Toombs & Rixon, 1959), and R.1111 — in particular its skull — is the supreme example of a superbly preserved specimen prepared by those techniques.

9. In recent years new material of the genus has been discovered in southern England. One such find is the so-called 'small *Scelidosaurus*' or 'juvenile *Scelidosaurus*' BM(NH) Pal. Dept. no. R.6704 (referred to in Rixon, 1968; Charig, 1972 (pp. 123, 138–140); Thulborn, 1977; Charig, in preparation); another is a specimen of the neck region (a part of the animal that is mostly lacking in R.1111) acquired by the Natural History Museum, London, from the Japanese dealer Ryoichi Ebisawa; a third specimen is in the Bristol City Museum. A closely related genus (*Emausaurus* Haubold, 1990) has been described from the Upper Lias (Lower Toarcian) of northern Germany.

10. It was upon the 'small *Scelidosaurus*' that the discovery was made (Charig, 1972, pp. 123–124) that the ornithischian pubis — the most characteristic feature of that order — was primitively without a properly developed anterior ramus. This confirmed the belief that the posterior ramus represents the true pubis, rotated backwards.

11. *Scelidosaurus* is an important and much discussed genus, as shown by the following:

- (1) at the time of its discovery and original description specimen R.1111 was not only one of the most complete dinosaur skeletons known but also represented a dinosaur quite unlike any other found previously (or indeed since, apart from a few very close relatives found all much less complete in rocks of similar age);
- (2) until Broom (1911) described *Geranosaurus*, *Scelidosaurus* was the geologically oldest ornithischian dinosaur known;
- (3) *Scelidosaurus* remains at the centre of the controversies surrounding the origin and early radiation of the Ornithischia, the relationships between the major subdivisions of the Thyreophora, and the vexed question of whether or not the quadrupedal ornithischians were primarily or secondarily quadrupedal;
- (4) it is the type genus of the family SCOLIDOSAURIDAE Huxley, 1869 (Cope was actually the first to use the family name, in a two-part lecture read in September 1868 and April 1869 but not published until December 1871; see p. 91 of that work), and is also the basis of the higher taxon Scelidosauria of some authors;
- (5) *Scelidosaurus* appears not only in esoteric articles: it is often mentioned and illustrated in popular works (indeed, models of the restored animal can be bought in museum shops), and it is therefore not unknown to the general public.

12. In view of the above it is highly desirable that the accepted nomenclature, as used at present by everyone, should be conserved. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary powers to set aside all previous designations of a lectotype of *Scelidosaurus harrisonii* Owen, 1861;
- (2) to confirm the designation in para. 4 above of the skull and skeleton BM(NH) Pal. Dept. no. R.1111 in the Natural History Museum, London, as the replacement lectotype;
- (3) to place on the Official List of Generic Names in Zoology the name *Scelidosaurus* Owen, 1859 (gender: masculine), type species by subsequent monotypy *Scelidosaurus harrisonii* Owen, 1861;

- (4) to place on the Official List of Specific Names in Zoology the name *harrisonii* Owen, 1861, as published in the binomen *Scelidosaurus harrisonii* and as defined by the lectotype confirmed in (2) above (specific name of the type species of *Scelidosaurus* Owen, 1859).

References

- Broom, R. 1911. On the dinosaurs of the Stormberg, South Africa. *Annals of the South African Museum*, 7: 291–308.
- Buckland, W. 1824. Notice on the *Megalosaurus* or great fossil lizard of Stonesfield. *Transactions of the Geological Society of London*, (2)1: 390–396.
- Charig, A.J. 1972. The evolution of the archosaur pelvis and hind-limb: an explanation in functional terms. Pp. 121–155 in Joysey, K.A. & Kemp, T.S. (Eds.), *Studies in vertebrate evolution: essays presented to Dr F.R. Parrington, F.R.S.* 284 pp. Oliver & Boyd, Edinburgh.
- Cope, E.D. 1871. Synopsis of the extinct Batrachia, Reptilia and Aves of North America. *Transactions of the American Philosophical Society*, (2)14: 1–252.
- Haubold, H. 1990. Ein neuer Dinosaurier (Ornithischia, Thyreophora) aus dem unteren Jura des nördlichen Mitteleuropa. *Revue de Paléobiologie*, 9(1): 149–177.
- Huxley, T.H. 1869. On the Dinosauria of the Trias, with observations on the classification of the Dinosauria. *Nature*, 1: 146.
- Lydekker, R. 1888. *Catalogue of the fossil Reptilia and Amphibia in the British Museum (Natural History)*, part 1. xxviii, 309 pp. British Museum (Natural History), London.
- Meyer, H. von. 1832. *Palaeologica zur Geschichte der Erde und ihrer Geschöpfe*. xii, 560 pp. Schmerber, Frankfurt am Main.
- Newman, B.H. 1968. The Jurassic dinosaur *Scelidosaurus harrisonii*, Owen. *Palaeontology*, 11: 40–43.
- Owen, R. 1859. *Palaeontology*. Pp. 91–176 in: *Encyclopaedia Britannica* (Ed. 8), vol. 17. 815 pp. Adam & Charles Black, Edinburgh.
- Owen, R. 1860. *Palaeontology or a systematic summary of extinct animals and their geological relations*. xv, 420 pp. Adam & Charles Black, Edinburgh. [Also Ed. 2, 1861.]
- Owen, R. 1861. A monograph of a fossil dinosaur (*Scelidosaurus harrisonii*, Owen) of the Lower Lias. In: A monograph of the fossil Reptilia of the Liassic Formations. *Monograph of the Palaeontographical Society*, 1: 1–14.
- Owen, R. 1863. A monograph of a fossil dinosaur (*Scelidosaurus harrisonii*, Owen) of the Lower Lias, Part II. In: A monograph of the fossil Reptilia of the Liassic Formations. *Monograph of the Palaeontographical Society*, 2: 1–26.
- Rixon, A.E. 1949. The use of acetic and formic acids in the preparation of fossil vertebrates. *Museums Journal*, 49(5): 116.
- Rixon, A.E. 1968. The development of the remains of a small *Scelidosaurus* from a Lias nodule. *Museums Journal*, 67(4): 315–321.
- Thulborn, R.A. 1977. Relationships of the Lower Jurassic dinosaur *Scelidosaurus harrisonii*. *Journal of Paleontology*, 51(4): 725–739.
- Toombs, H.A. 1948. The use of acetic acid in the development of vertebrate fossils. *Museums Journal*, 48(3): 54–55.
- Toombs, H.A. & Rixon, A.E. 1959. The use of acids in the preparation of vertebrate fossils. *Curator*, 2(4): 304–312.
- Woodward, A.S. & Sherborn, C.D. 1890. *A catalogue of British fossil Vertebrata*. xxxv, 396 pp. Dulau, London.